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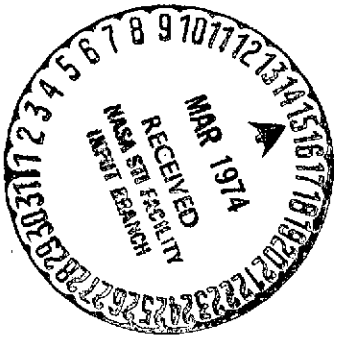
PARADOX OF SLEEP MEMORIZATION IN RATS AS A RESULT OF DELAYED SLEEP

P. Leconte and E. Hennevin

Translation of "Sommeil paradoxal et memorisation : effet du delai d'endormissement chez le rat," Journal de Physiologie (Paris) Volume 65, (Suppl) October 1972, pp. 255A-256A.



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16. Abstract

Experiments carried out on 36 rats proved that avoidance conditioning is followed by an increase induration of paradoxal sleep (PS). When as much as 180 minutes is allowed between conditioning and possibility of sleep no significant modification of length of PS is noted.

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PARADOX OF SLEEP MEMORIZATION IN RATS AS A RESULT OF DELAYED SLEEP[1]

P. Leconte and E. Hennevin[2]

In previous research [1, 2] we were able to show that an avoidance conditioning in rats is followed by a significant increase in the duration of paradoxical sleep (PS). This increase, which is owing to an increase in the number of phases of PS, may only be seen for the first hour following the learning. /255A*

It is a matter of knowing whether this phenomenon, which has an immediate and brief character, lasts after the experimental introduction of a delay between the conditioning and the going to sleep.

Thirty-six rats carrying electrocorticographic and myographic electrodes were divided into three groups and coached into an avoidance conditioning by means of a daily session of 15 trials. By means of total deprivation of sleep (so-called bath method), delays with varying duration (0.90 min., 80 min.) are introduced between each conditioning session and the possibility the animal has to sleep. /256A

For each one of the three groups (D0, D90, and D180), the durations of PS obtained then out of two hours of recording are compared to reference values obtained before the conditioning.

Our results showed that:

-Group D0 revealed a significant increase in the duration of PS. This increase is related to the level of acquisition of the conditioning and is reduced to zero on the fourth day when the plateau is reached (80% good responses).

-The same phenomenon is noted in group D90. However, the reaching of the plateau is delayed (80% good responses received on the sixth instead of the fourth day of conditioning).

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-The group D180 reveals no significant modification of the duration of PS. These animals, furthermore, are found to be incapable of exceeding 35% of good responses after six conditioning sessions.

In conclusion, these findings confirm the fact that a conditioning is followed by an increase in the duration of PS. This increase lasts inspite of a delay of 90 minutes and, in this case, the learning is quite seriously disturbed.

The existence of such a correlation between the duration of PS following learning and the acquisition rate of the latter reinforces the hypothesis according to which the PS plays a role in the mechanisms of information processing.

REFERENCES

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2. Leconte, P. and Hennevin, E. (1971). C. R. Acad. Sci. Paris, 273, 86-88.

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